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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,512	11/30/2000	Teruhiko Imoto	001431	5196

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EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

7

DATE MAILED: 07/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/701,512

Applicant(s)

IMOTO ET AL.

Examiner

Julian A. Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-10 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 6-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 2, 4 and 5 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Remarks

Claims 1 and 6-10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 6.

Claims 2, 4 and 5 are pending for consideration.

Claim Objections

Claim 2 is objected to because of the following informalities:

In claim 2 at line 25 of the claim, i.e. the last line, it is suggested to delete the redundancy in reciting “an atom manganese Mn” to either the element or its elemental symbol.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation “heat-treating and sintering the particles” in lines 14-15. This limitation is indefinite as “heat-treating” and “sintering”, at least when broadly interpreted, are not mutually exclusive, thus, it is unclear if there are two separate and distinct heating steps

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in the treatment of the particles. Since “sintering” is a subset of “heat-treating” in that it is understood by the skilled artisan to be a heat-treatment step below the melting point of the material being treated, it is suggested to change “heat-treating and sintering” to --heat-treating by sintering--.

Claim 2 recites the limitation “the hydrogen absorbing alloy having a sintered surface region and a bulk region covered with the surface region” in lines 19-21. There is insufficient antecedent basis for this limitation in the claim. It is suggested to insert --, the hydrogen absorbing alloy-- after “the hydrogen absorbing alloy” so as to emphasize “the hydrogen absorbing alloy” as being produced by the method, while further having the additional properties of a “sintered surface region” and “bulk region”.

Claim 2 recites the limitation “the first step” in line 3, the limitation “the second step” in line 12 and the limitation “the third step” in line 14. There is insufficient antecedent basis for each of these limitations in the claim. In each claim, it is suggested to change the definite article “the” to --a--.

Claim 2 recites the limitation “the respective abundance ratios” in line 22 and line 24 (both instances). There is insufficient antecedent basis for this limitation in the claim.

Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, by virtue of their dependency to claim 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ise et al. (WO97/50135) in view of Rendina (U.S. Pat. 5,932,372).

As the WO document is in a non-English language, for purposes of discussion the examiner relies on U.S. Patent 6,255,018, which is an equivalent to WO97/50135.

As to claim 1, Ise teaches a method of producing a hydrogen absorbing alloy for an alkaline battery, wherein a first step of obtaining particles represented by the formula

$\text{MmNi}_{3.4}\text{Co}_{0.8}\text{Al}_{0.2}\text{Mn}_{0.6}$ as found in column 13 lines 44-52:

Preparation of Powdery Hydrogen-Absorbing Alloy

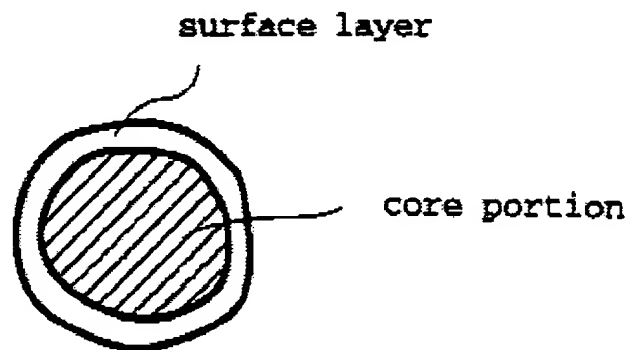
A commercially available Misch metal (Mm: a mixture of rare earth metals such as La, Ce, Nd and Pr), nickel (Ni), cobalt (Co), aluminum (Al) and manganese (Mn) were mixed in an element ratio of 1:3.4:0.8:0.2:0.6, and then heat-treated in a high-frequency fusion furnace to prepare a hydrogen-absorbing alloy ingot represented by a composition formula of $\text{MmNi}_{3.4}\text{Co}_{0.8}\text{Al}_{0.2}\text{Mn}_{0.6}$. In turn, the hydrogen-absorbing alloy ingot was annealed at 1,000° C. for 10 hours.

In this formula, M is specifically disclosed as Al, the subscript "x" in being present at 3.4 satisfies the instant $3.0 \leq x \leq 5.2$, the subscript "y" in being present at 0.8 satisfies the instant $0 \leq y \leq 1.2$, and the subscript "z" in being present at 0.6 satisfies the instant $0.1 \leq z \leq 0.9$. The sum of x, y and z at 4.8 satisfies the instant $4.4 \leq x + y + z \leq 5.4$. A second step of treating the particles with an acid solution is specifically disclosed in column 14 line 12 et seq., an excerpt here follows:

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Subsequently, samples of the alloy M1 were surface-treated with the respective acid treatment solutions. For the surface treatment, the samples of the alloy M1 were respectively immersed in the acid treatment solutions of a weight equivalent to that of the sample, and the acid treatment solutions were each stirred by means of a stirring mixer until the pH level of the acid treatment solution reached pH 7. The alloy samples respectively surface-treated with the metal-ion-containing acid treatment solutions were rinsed with pure water and dried. Thus, hydrogen-absorbing alloy samples No. 1 to No. 9 according to the first inventive mode group were obtained (see Table 1-1).

As to "the hydrogen absorbing alloy having a sintered surface region and a bulk region covered with the surface region" and subsequent limitations as recited in claim 2, lines 19-25, these limitations have not been given patentable weight, as the product limitations fail to further limit and give breadth and scope to the method claim. Of note, however, Ise teaches a surface region, i.e. "surface layer" and a bulk region, i.e. "core region" covered by the surface region as shown in Figure 2:

Fig. 2

As to claim 2, both a nickel compound such as nickel hydroxide and a cobalt compound such as cobalt hydroxide are added to the acid solution as found in column 13, line 58 et seq.:

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Acid Treatment

Five hydrochloric acid aqueous solutions having initial pH levels of pH 0.5, pH 1, pH 2, pH 3 and pH 4, respectively, were prepared, and 1 wt % nickel hydroxide was dissolved in the respective hydrochloric acid solutions. Thus, acid treatment solutions each containing nickel ions (metal-ion-containing acid treatment solutions) were prepared. On the other hand, four hydrochloric acid solutions each having an initial pH level of pH 1 were prepared, in which cobalt hydroxide, copper hydroxide and bismuth hydroxide were respectively dissolved in a concentration of 1 wt %. Thus,

four metal-ion-containing acid treatment solutions were prepared which respectively contained different metal ions dissolved therein. Further, a metal-ion-containing acid treatment solution containing 1 wt % nickel hydroxide and 1 wt % aluminum hydroxide dissolved in a hydrochloric acid

In the abovesited disclosure, the pH of the acid solution can be found disclosed at an initial pH of 1, with the nickel and cobalt compounds present. (applies to claim 3)

While Ise does not explicitly teach a third step of sintering, Rendina teaches that a heat-treatment step such as sintering is desired in order to "enhance the binding of the various components of [a] composite to each other", as found in column 12 lines 42-45.:

The principal purpose for heat treating the composite between each application of new passivating material is to enhance the binding of the various components of the composite to each other. It is believed that when (Q) is a

As to a hydrogen atmosphere, Rendina teaches the following in column 12 lines 59-64:

for primary, passivating, and inclusion. Further, the treatments selected may be any of those known in the art, such as calcining, sintering, annealing, heating to polymerize, or others. The composite material may be heat treated in an appropriate, selected environment, such as under air, inert gas, reducing gas, vacuum, pressurized gas, or others.

Thus, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify Ise's invention by employing a sintering step. The motivation for such a modification, as taught by Rendina, would be to enhance the adhesion between the surface layer and core portion of the hydrogen storage alloy.

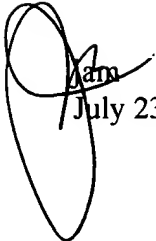
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian A. Mercado whose telephone number is (703) 305-0511. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3599 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


July 23, 2002


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700